Supply

RIDLEY COLLEGE
SINCE 1889

Assessment Objectives

Specific Expectations	
2.C	Define (using graphs as appropriate) the law of supply.
2.C	Explain (using graphs as appropriate) the relationship between the price of a good or service and the quantity supplied.
2.D	Explain (using graphs as appropriate) the determinants of supply.

Supply

- The **supply** of an individual firm indicates the various quantities of a good (or service) a firm is willing and able to produce and supply to the market for sale at different possible prices, during a particular time period, *ceteris paribus*.
  - Supply is concerned with the behaviour of sellers, which include firms in the product markets and households in the resource markets.
  - **Quantity supplied** is the amount of the good that firms are willing to purchase at each price

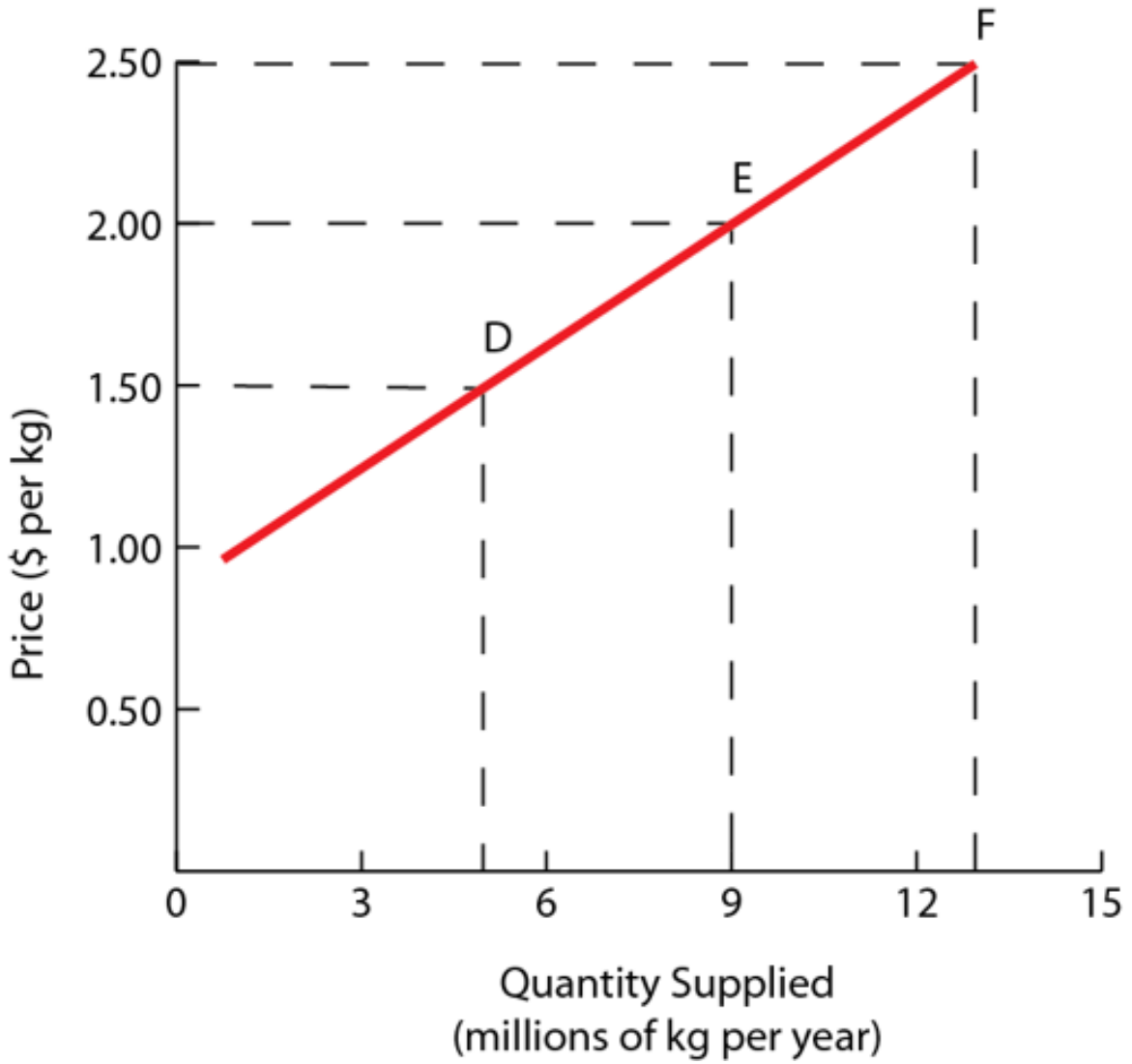
Supply curve

- **Supply schedule:** is a list of the quantities of a good or service supplied at different prices, holding everything else constant (all other factors that influence firms ability to supply the market)

Price ($CAD per kg)	Quantity Supplied (kg per year)	Point on Graph
$1.50	5	D
$2.00	9	E
$2.50	13	F

- **Supply curve:** is a curve showing the relationship between the price of a good and the quantity of the good supplied, *ceteris paribus*.
  - A change in the quantity supplied means that there is a movement along the supply curve (for instance, from D to E).

Supply curve (Continued)



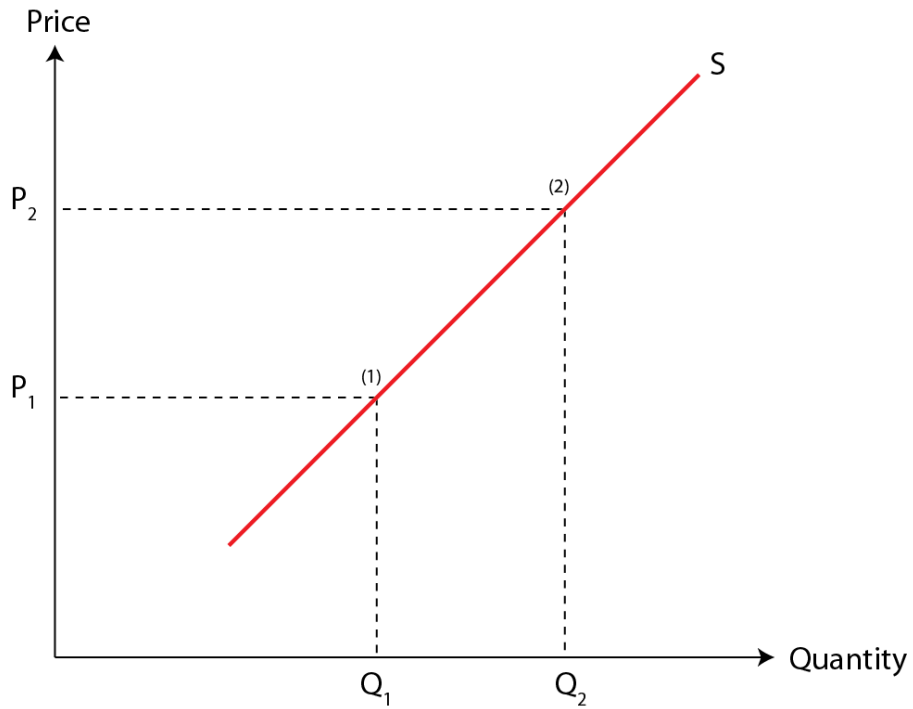
Market Supply

- **Market supply:** is the sum of all individual firms' supplies for a good. The market supply curve illustrates the law of supply, shown by a positive relationship between price and quantity supplied

Price ($CAD per kg)	Quantity Supplied (Firm A)	Quantity Supplied (Firm B)	Market Supply
$1.50	5	7	12
$2.00	9	11	20
$2.50	13	15	28

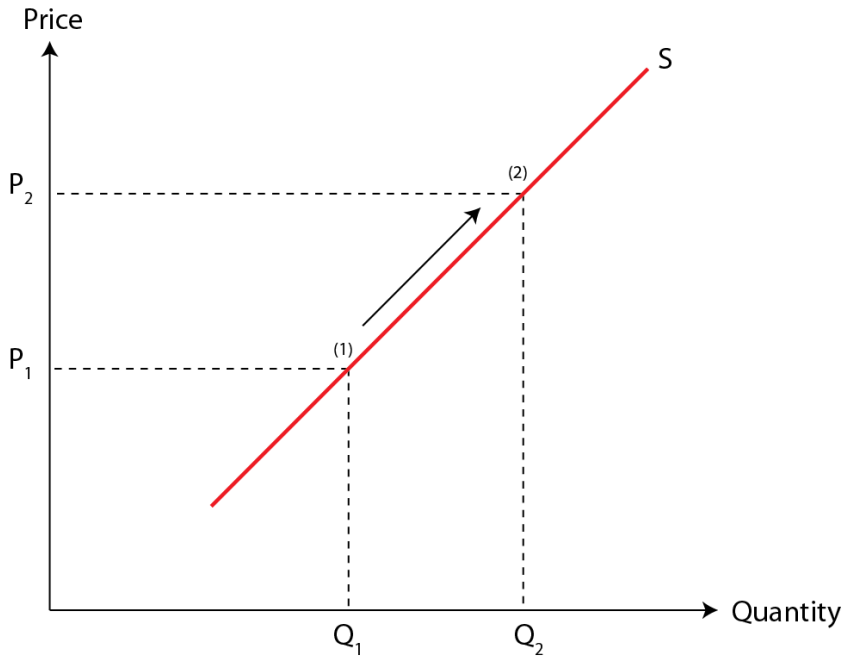
Law of supply

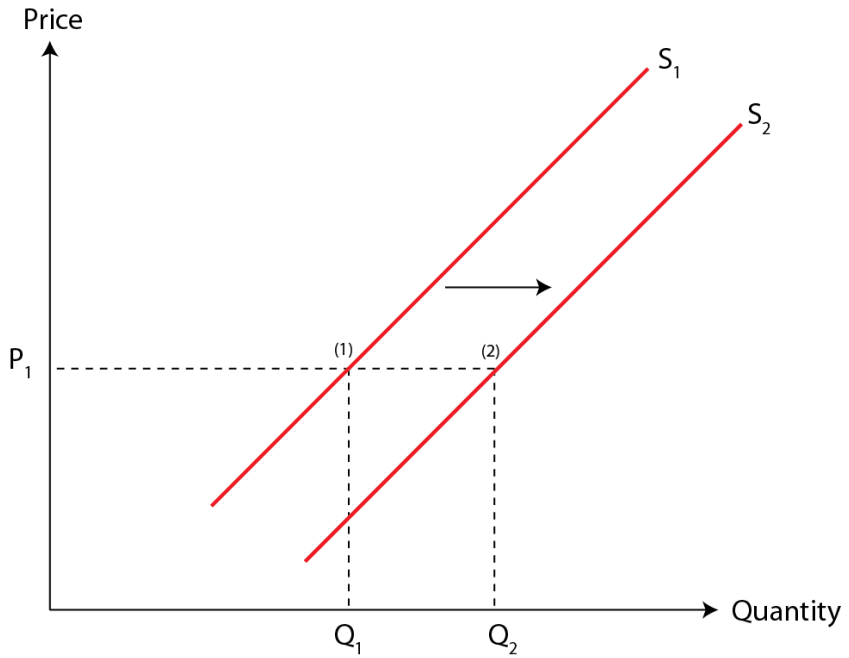
- **Law of supply:** a law stating that there is a positive relationship between the quantity of a good supplied over a particular time period and its price, *ceteris paribus*.
  - As the price of the good increases (decreases), the quantity of the good supplied also increases (decreases).



Changes in supply vs. Changes in quantity supplied

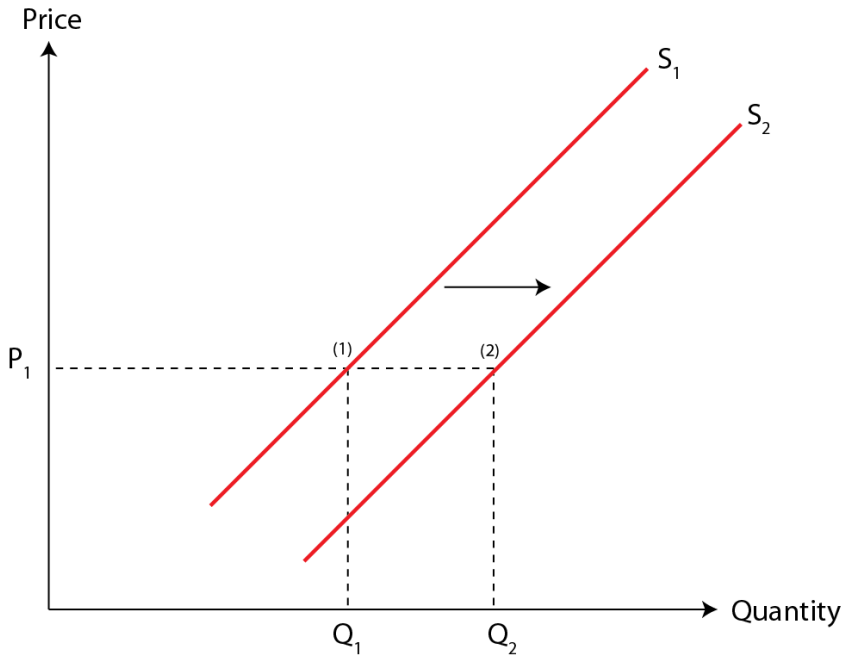
- Any change in price produces a **change in the quantity supplied**, shown as movement on the supply curve.
- Any change in a non-price determinant of supply leads to a **change in supply**, represented by a shift of the entire supply curve.

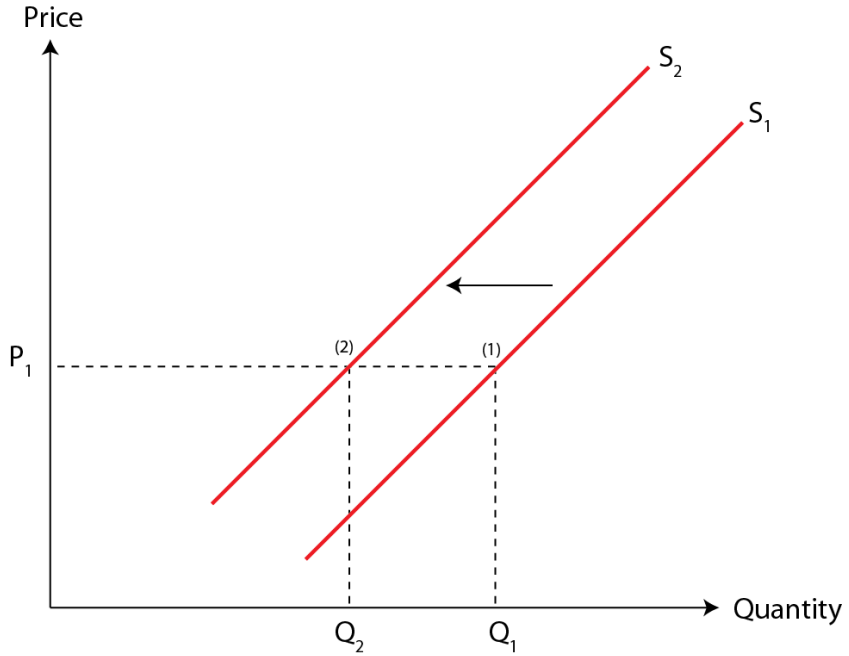




Changes in supply

- An **increase (decrease) in supply** shifts the supply curve downwards (upwards) and to the right (left). The quantity supplied increases (decreases) at every price.





Non-price determinants of supply

- The **non-price determinants of supply** are the variables other than price that can influence supply.
  - They are the variables assumed to be unchanging by use of the ceteris paribus assumption.
  - Changes in the non-price determinants of supply cause shifts in the supply curve where the entire supply curve moves to the right or to the left.

1. **Costs of factors of production (Factor or resource prices)**
   - The firm buys various factors of production (land, labour, capital, entrepreneurship) that it uses to produce its product.
   - If a factor price rises (falls), production cost increase (decrease), production becomes less (more) profitable and the firm produces less (more); the supply curve shifts to the left (right).

Non-price determinants of supply (Continued)

2. **Number of firms (Size of the market)**
   - An increase (decrease) in the number of firms producing the good increases (decreases) supply resulting in a rightward (leftward) shift in the supply curve.
3. **Technology used in the production of a good**
   - A new improved technology lowers costs of production, thus making production more profitable. Supply increases and the supply curve shifts to the right.
4. **Shocks or sudden unpredictable events**
   - Sudden, unpredictable events called "shocks", can affect supply, such as weather conditions in the case of agricultural products, war, or natural/man-made catastrophes.

Non-price determinants of supply (Continued)

5. **Taxes (Government intervention)**
   - Taxes (indirect or taxes on profits) are treated as if they were costs of production, so supply will decrease and the supply curve shifts to the left.

6. **Subsidies (Government intervention)**
   - Subsidies are payments made to the firm by the government and have the opposite effect of a tax.
   - The introduction of a subsidy or an increase in an existing subsidy is equivalent to a fall in production costs, resulting in a rightward shift of the supply curve.

7. **Price of related goods (Competitive supply)**
   - **Competitive supply (Substitutes in production)** of two or more products refers to production of one or the other by a firm; the goods compete for the use of the same resources, and producing more of one means producing less of the other.

Non-price determinants of supply (Continued)

8. **Price of related goods (Joint supply)**
   - **Joint supply (Complements in production)** of two or more products refers to production of goods that are derived from a single product, so that it is not possible to produce more of one without producing more of the other.
   - The increase in the price of one leads to an increase in its quantity supplied and also to an increase in supply of the other joint product(s).

9. **Producer (firm) price expectations**
   - If firms expect the price of their product to rise, they may withhold some of there current supply from the market (not offer it for sale), expecting that they will be able to sell it at a higher price in the future.
   - If the expectation is that the price of their product will fall, supply increases in the present to take advantage of the current higher price, hence a rightward shift in the supply curve.

Short-run and the long-run in microeconomics

- The law of supply is based on the relationship between production and costs of production.
  - The **short-run** is the time period during which at least one input is fixed and cannot be changed by the firm.
    - The buildings and heavy machinery that are unchanging are **fixed**, whereas labour and materials are **variable**.
  - The **long-run** is a time period in which all inputs can be changed.
    - In the long run the firm has no **fixed** inputs; we say all inputs are **variable**.
    - This is the time period the firms can build new buildings and factories and buy more heavy machinery.
  - Note that the short run and the long run do not correspond to any particular length of time.
  - Some industries may change their fixed inputs over weeks or months while others may do so over many years.

Law of diminishing marginal returns

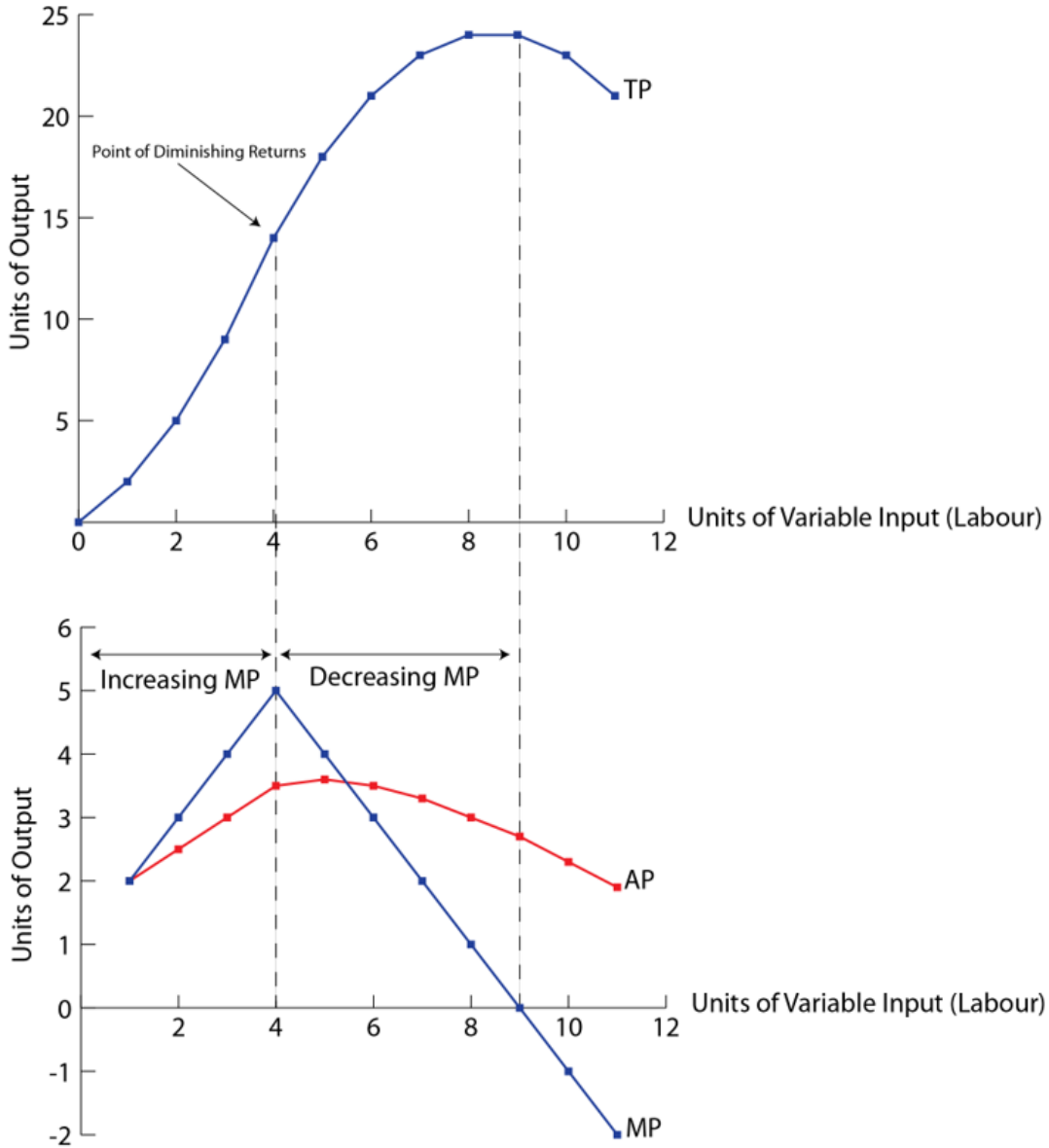
- In the short-run there is a pattern on increasing and then falling marginal product.
  - The **law of diminishing marginal returns** states that as more and more of a variable input (such as labour) are added to one or more fixed inputs (such as land), the marginal product of the variable input at first increases, but there comes a point where it begins to decrease.
    - The relationship presupposes that the fixed input(s) remain fixed, and that the technology of production is also fixed.
    - **Total product** is the total quantity of output produced by the firm.
    - **Marginal product** is the extra or additional output produced by one additional unit of a variable input.

$$\text{MP} = \frac{\Delta \text{TP}}{\Delta \text{Labour}}$$

Law of diminishing marginal returns: Example

Labour (L)	Total Product (TP)	Marginal Product (MP)	Average Product (AP)
0	0	–	–
1	2	2	2
2	5	3	2.5
3	9	4	3
4	14	5	3.5
5	18	4	3.6
6	21	3	3.5
7	23	2	3.3
8	24	1	3
9	24	0	2.7
10	23	-1	2.3
11	21	-2	1.9

Law of diminishing marginal returns: Example



Increasing marginal costs & the firm's supply curve

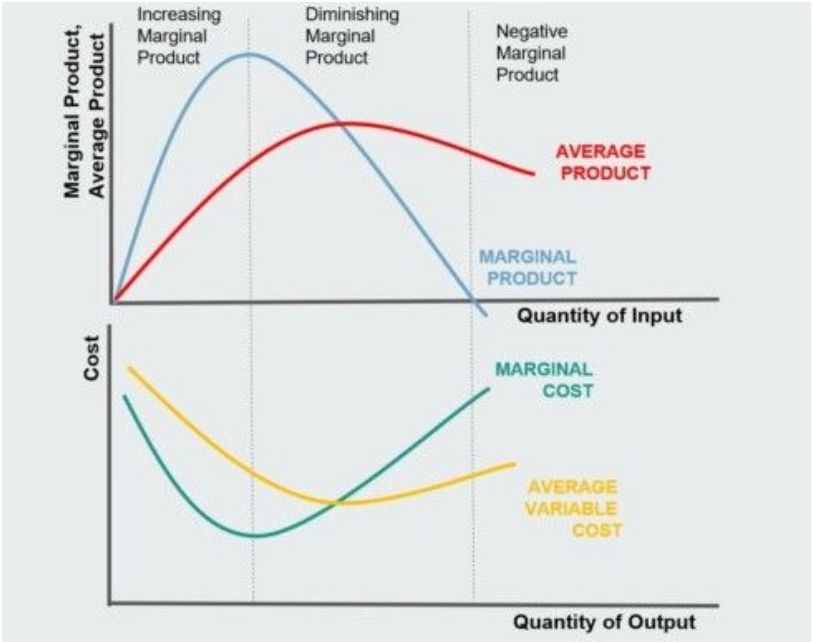
- There is a relationship between diminishing marginal returns, costs of production, and the firm's supply curve.
  - **Total costs** are the total costs incurred by a firm that undertakes production of a good or service.
  - **Marginal cost** are the extra or additional cost of producing one more unit of output.
    - It tells us by how much total costs increase if there is an increase in output by one unit.

$$MC = \frac{\Delta TC}{\Delta Q}$$

  - When marginal product increases, marginal cost decreases; when marginal product is maximum, marginal cost is minimum; and when marginal product falls, marginal cost increases.

Increasing marginal costs & the firm's supply curve

- The firm's supply curve is a portion of its marginal cost curve that shows the price-quantity combination where the extra cost of producing one more unit of output (the marginal cost) is equal to the price of that unit.
  - A firm making an economic loss in the short-run will continue to produce a positive level of output as long as $P \geq AVC$.



Test your understanding

Question: Using diagrams, show the impact of each of the following

1. The number of consumers in the market for product A increases
2. Consumer income increases and product A is an inferior good
3. Consumer income decreases and product A is a normal good
4. A news report claims that use of product A has harmful effects on health
5. The price of substitute good B falls
6. The price of complementary good B increases

Summary

- **Enduring Understanding**
  - In a competitive market, demand for and supply of a good or service determine the equilibrium price.
- **Essential Knowledge**
  - The law of supply states there is a positive relationship between price and quantity supplied, leading to an upward-sloping supply curve.
  - Factors that influence producer supply, such as changes in input prices, cause the market supply curve to shift.